U. S. Steel Gary Works Strategic Coke Improvement Project

Health and Safety Plan for Walbridge to

Manage Potential Worker Exposure to Manganese and Iron at U. S. Steel Gary Works

Soil sampling of the project's main construction site indicate elevated levels of both manganese and iron which are above conservative RCRA construction worker screening values. Due to the nature of the work on the site which includes the excavation, stockpiling, backfilling and compaction of the sub-grade in the affected areas, it is necessary to implement safe work methods where there is a potential risk of exposure. According to the USEPA Technology Transfer Network Air Toxics Web Site, Manganese is considered to have moderate acute toxicity based on short-term tests in rats. However, other animal tests in which manganese has been given orally have indicated that manganese has low acute oral toxicity. Chronic exposure to manganese at low levels is nutritionally essential in humans. Over exposure of humans to manganese results primarily in effects on the nervous system including slower visual reaction time, poorer hand steadiness, and impaired eye-hand coordination. Chronic inhalation exposure of humans to high levels of manganese may also result in a syndrome called manganism that typically begins with feelings of weakness and lethargy and progresses to other symptoms such as gait disturbances, clumsiness, tremors, speech disturbances, a mask-like facial expression, and psychological disturbances. Other chronic effects reported in humans from inhalation exposure to manganese are respiratory effects such as an increased incidence of cough, bronchitis, dyspnea during exercise, and an increased susceptibility to infectious lung disease. The United States Occupational Safety and Health Administration (OSHA) has published a ceiling exposure limit of 5 milligrams per cubic meter of air for manganese but has not established a permissible exposure limit (PEL). The National Institute for Occupational Safety and Health (NIOSH) has developed a Recommended Exposure Limit (REL) of 1.0 mg/cubic meter of air as an 8-hour-time weighted average (TWA) for manganese. Iron, while also a concern identified in the soil at the site, does not pose as great a threat to human health as manganese and was also found at fewer soil sampling locations. The controls and personal protective equipment (PPE) recommended to reduce manganese exposure will also help to reduce potential iron exposures.

Walbridge has developed the following Health & Safety recommendations with regard to the work to be performed by Walbridge and its subcontractors during the referenced project:

Training

- All workers will be trained with regard to the effects of exposure to dust containing manganese and iron.
- Workers will be trained as to the engineering and administrative controls to be utilized to minimize exposures.

- Workers will be trained with respect to required PPE, donning and doffing PPE, and appropriate personal hygiene considerations.

Engineering and Administrative Controls

- General dust control will be provided to minimize generation of dust in accordance with the U. S. Steel requirements.
- Mechanical equipment usage will be maximized to perform the work where feasible.
- Upon opening a trench for utility installation, dust suppression methods and work practices will be utilized to minimize exposures. These methods and practices will include misting soils, installing a 4" layer of sand or un-impacted material at the bottom of the trench, and providing access and egress into the trench that will minimize soil disturbance.
- Use of respirators with applicable dust cartridges will be evaluated if engineering controls prove insufficient to control the exposure.

Exposure Monitoring

Exposure monitoring will be performed during the first week of work to develop an Initial Exposure Assessment. An SKC Universal XR Personal Sampling Pump (or equivalent) will be utilized with a Zefon Filter (or equivalent) to collect air samples for laboratory testing. Upon completion of this first week, data will be evaluated and a Negative Exposure Assessment developed. At that time PPE and continued monitoring considerations will be evaluated including the potential need for respiratory protection.

Exposure monitoring for workers will be provided as follows:

- Backhoe and equipment operators and workers ancillary to the excavation work will wear personal air sampling pumps with filters to capture particulate dust for laboratory analysis to evaluate potential manganese and iron exposure throughout the work-shifts for the first week. This data will be utilized to calculate a personal exposure 8-hour TWA
- Representative exposure samples will be collected from the breathing zone of workers entering the trench for any purpose. Workers selected for representative exposure sampling will wear personal air sampling pumps with filters to capture particulate dust for identifying manganese and iron exposure throughout the work-shift to establish a personal exposure TWA.
- Additionally, workers expected to be exposed to the most elevated concentrations of manganese and iron will wear personal air sampling pumps to evaluate ceiling limits for manganese and iron exposure. This sampling is performed for a period of 15 minutes and a minimum of 3 short term samples to evaluate ceiling limits shall be collected daily.
- Ambient air monitoring will also be conducted to evaluate dust control measures for the first week of construction activity. This activity will utilize real-time dust analyzers placed upwind and downwind of the excavation activities. A DataRam 4 analyzer, or equivalent, will be used for ambient air monitoring.

PPE

- Workers associated with excavation work, at a minimum, will wear steel-toed boots with metatarsal guards, eye protection, long sleeve shirt, long pants, gloves and hard hats.
- Initially, workers will wear Tyvek disposable coveralls with head and foot covers.
- If necessary, workers will wear nitrile gloves with a cotton or leather glove over the nitrile layer.
- Use of respirators with applicable dust cartridges will be evaluated if engineering controls prove insufficient to control the exposure.